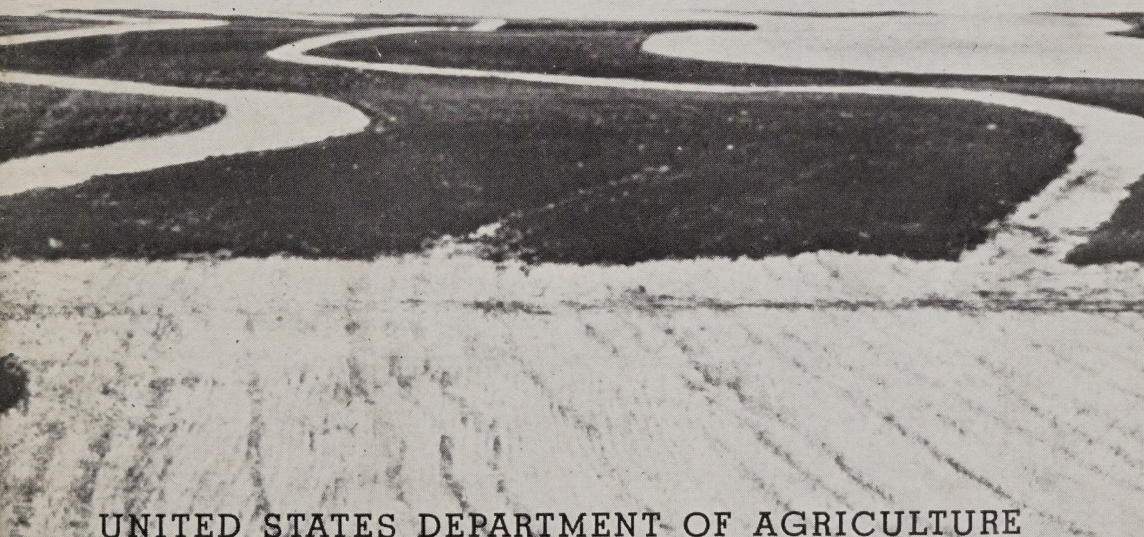
SOIL and WATER CONSERVATION

IN THE NORTHERN GREAT PLAINS



UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, REGION NINE • 1937

FOREWORD . . . Soil is one of the most precious gifts which nature bestows on man. It is the indispensable basis of all farming operations. Yet we in this country have used our soil resources with a negligence and prodigality perhaps unequaled in the history of mankind. A total area approximately as large as the State of South Dakota—50 million acres of once productive American farmland—has been essentially ruined for further crop production by heavy topsoil losses and gullying. An additional 50 million acres are in a condition almost as serious. Another 100 million acres have been severely impoverished by erosion. And the process of removal is rapidly getting under way on yet another 100 million acres.

● Water is as necessary to the farmer as soil. Without it, no crops will grow; no living thing can survive. In the past, American farmers have wasted their water resources much as they have spent their soil. Careless farming practices allow rain water or melted snow to run rapidly off the land instead of sinking into the earth to nourish the growth of crops and grasses. Rain is scarce in the northern Great Plains and no farmer can afford to waste the precious amount that does fall. But dust storms and droughts extending over a far-reaching front furnish vivid evidence that insufficient moisture is being stored in nature's great reservoir beneath the ground.

● To help farmers check these soil and water losses, to aid them in the defense of their lands is the job of the Soil Conservation Service, a bureau of the Department of Agriculture. By means of practical demonstrations on the land itself, the Service is showing how profitable farming operations can be made consistent with soil and moisture conservation. On its erosion-control areas scattered throughout the country the Service is exhibiting a wide variety of conservation farming practices in actual operation. These practices vary from one section of the country to another, from farm to farm, and even from field to field. The pattern for any one piece of agricultural land must be based on natural needs and adaptabilities.

● It is the purpose of this booklet to analyze and explain the forces of erosion and to describe and depict the conservation farming practices which the Service is using in its demonstration areas in the northern Great Plains region. It is hoped that farmers will visit these demonstration areas and see for themselves the methods of erosion control which they can apply on their own farms. Members of project staffs are always glad to answer questions and offer advice.

PHOTO COURTESY GEOLOGIC SURVEY

ONLY YESTERDAY

When members of the Hayden Expedition trekked through the northern Great Plains in 1870 they found the land covered with a profuse growth of native grasses. Within the memory of men now living, cover like that shown above flourished over wide areas, protecting the soil against the high winds, keeping it porous and in condition to absorb the rainfall.

GRAZING HERDS

The Plains grass provided excellent feed for sheep and cattle, but the early stockman was careless in his use of nature's bounty. Too often he overgrazed the range and thinned out the native cover that protected the soil against rain and wind. "Blow spots"—areas where the soil lay completely exposed to the high prairie winds—began to appear and multiply.

THE PLOW

The Settler who followed the stockman usually brought along a sod-breaking plow in his covered wagon. Homesteading laws required him to put a certain portion of his allotment into cultivation. A few decades later demands for increased wheat production to supply World War needs resulted in the plowing of vast additional tracts. Through the 1920's the trend away from grazing toward small-grain farming continued. A great area of native grassland was turned under, its soil laid bare to the action of wind and rain.

DUST

In the early 1930's came years of extremely low rainfall. Even less moisture than usual fell on the parched ground. The Plains soil lay exposed, fine, and dry—a perfect target for high prairie winds. In 1934 the winds came, lifting the soil high, to darken the sun across the continent and to travel on for hundreds of miles over the Atlantic Ocean. That "black blizzard" was the first of its kind in United States history. Today such widespread dust storms are occurring with an almost appalling regularity.

UP IN SMOKE

Some Great Plains farmers burn their strawstacks and even their stubble and thus destroy valuable crop residues. From the standpoint of soil and water conservation, this is one of the most harmful farming practices. Burning off the stubble and stalks leaves the soil bare and unprotected. Charred plant debris washes into soil pores, clogging them and preventing satisfactory absorption of rainfall.

GUTTERS

The Farmer who runs his plow straight up and down the side of a slope creates a whole series of "gutters" which drain the water rapidly off the land. Swift-moving water is not easily absorbed by the earth. It carries enormous quantities of soil off the field. Eventually, the water cuts deep ruts that impede the progress of farm machinery. Fields denuded down to sterile subsoil, or stone, offer no basis for a profitable program of cultivation.

PROTECTION

Scattered stubble affords scant protection for the soil, but it is much better than none at all. Instead of plowing under his stubble after harvest, the farmer should leave a crop residue through the winter months. The stalks help to protect the soil from blowing in winter. The roots bind the soil and keep it on the field.

ON THE LEVEL

Crop Rows winding around the slope on the contour or true level of the land present a ridged surface to the escaping rain water or melted snow. Moisture trapped behind these ridges has ample time to sink deep into the soil and is unable to pick up the speed necessary for wholesale soil removal. The additional moisture held on the land helps keep the soil in proper condition to resist blowing and stimulates protective vegetative growth.

STRIP CROPPING

A Solid stand of clean-tilled crops such as corn leaves the soil largely unprotected against racing waters or blustering winds. Farming in strips or alternating bands of clean-tilled and close-growing crops reduces these hazards. Planted on the contour, the close-growing strips of hay and small grain check the downhill rush of water and filter out its soil load. Laid out across the path of the prevailing winds, they break up the sweeping currents of air and blanket the soil with a protective covering.

TERRACING

Any Obstacle in the path of flowing water decreases its cutting power and promotes its absorption by the soil. A terrace system consists of a series of broad-based ridges of earth thrown up across a sloping field on the contour. These sturdy barriers slow down even the heaviest rains. Often they are provided with drainage facilities in the form of a protected outlet to handle the excess water.

TREES

Trees Are treasured in the Plains country. Properly placed, usually on the windward side of fields and farmsteads, they break the force of the wind and reduce the wind erosion of adjacent soils. By diverting hot winds upward, they decrease evaporation with its drying of soils and its "burning" of crops.

GULLY CONTROL

Shrubs, grass, and trees will convert an unsightly, field-destroying gully into a stabilized waterway and a covert for wildlife. Fruits, berries, firewood and fence posts may be produced for home or farm use. Check dams built of brush, wire, stone, or other materials also help in the process of stabilization.

CONTOUR FURROWS

Grass needs water just as crops do. To insure an abundant growth of pasture grasses, the farmer or stockman should make every provision to save all the rain that falls. Shallow furrows run on the contour will trap the rain and spread it over the pasture. Thickened cover furnishes additional feed for livestock and extra protection for the soil.

ROUGH TILLAGE

Rough tillage is practiced both as an emergency measure to check wind erosion, and regularly, to protect soil from blowing, and to conserve moisture. Basin listing, which creates a series of "pockets" over the surface of a field, provides ridges on which wind has little effect and permits maximum storage of rain or snow water. Rough tillage also may be done with a duck foot cultivator or other implements which leave a roughened surface.

STOCK WATER

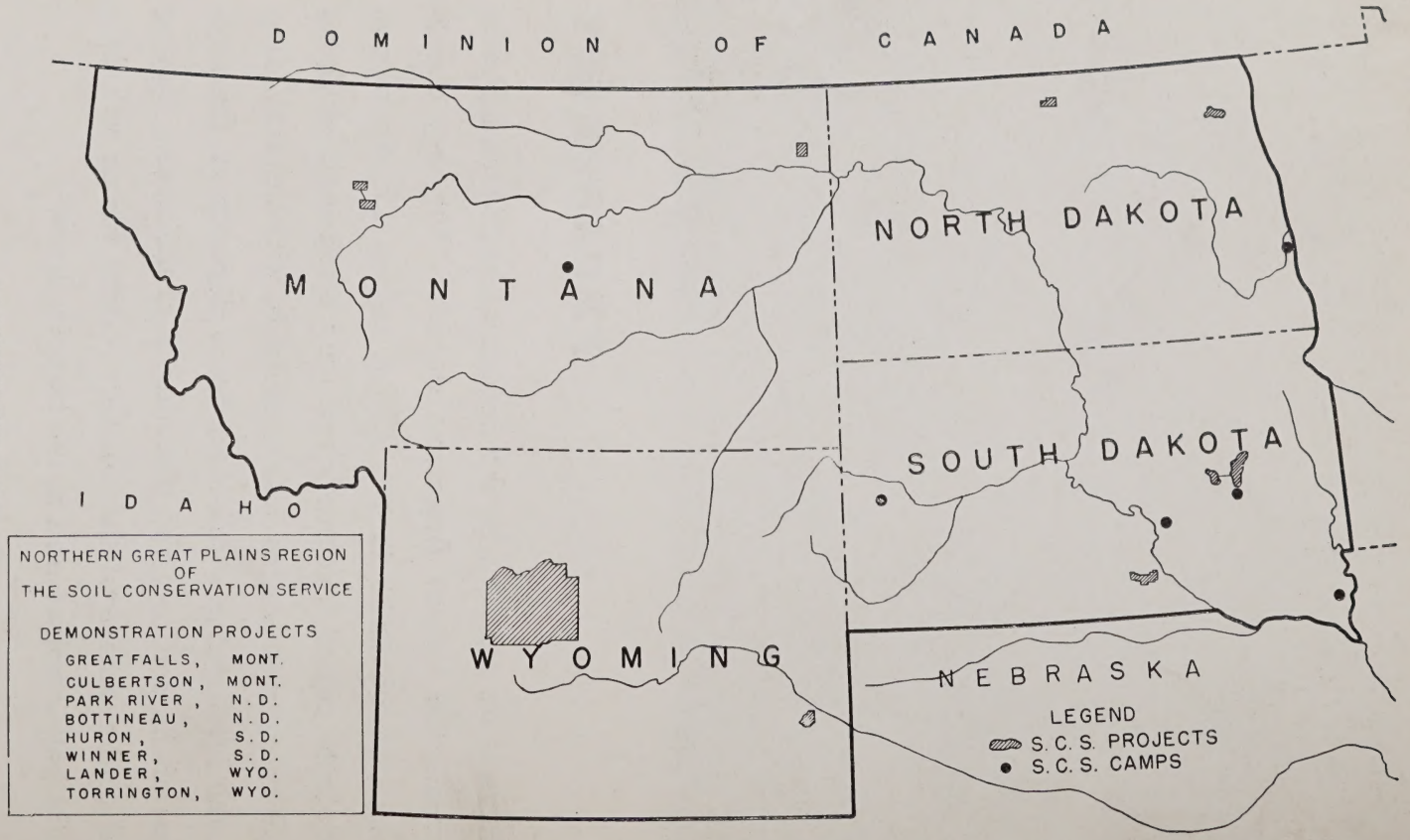
Dams built across natural drainageways will hold back the moisture that is so valuable to the Plains farmer. Careful range management includes an even distribution of livestock over the range so that desirable grasses are not grazed down too closely and destroyed as a source of feed or as a protective mantle for the soil. Properly located reservoirs permit more even use of the range, satisfy family needs, and furnish havens for wildlife.

EMERGENCY COVER

In Some parts of the region, emergency cover crops such as sorgo, Sudan grass, oats, and fall rye are used successfully to protect the soil and at the same time to provide needed feed when drought or blowing has ruined the pay crop. When listed in loose soils, they mature with minimum moisture in those sections adapted to such crops. The high stubble provides effective winter cover.

PROSPERITY

There is no reason why the northern Great Plains should become the "great American desert." Farming operations can continue in this broad region for an almost indefinite period if farmers will only bring their cropping and grazing practices into conformity with natural laws. In the last analysis, the farm home depends on the richness of the soil and the abundance of moisture. Saving soil and moisture in the northern Great Plains will help build better homes and make happier lives.



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